

### Abstract of the Disclosure

The invention provides a polynucleotide comprising a sequence encoding a polypeptide comprising a beta2-microglobulin molecule linked through its carboxyl terminal to a polypeptide stretch that allows the anchorage of the beta2-microglobulin molecule to the cell membrane, and through its amino terminal to at least one antigenic peptide comprising a MHC class I epitope, wherein said antigenic peptide is not related to an autoimmune disease and is preferably derived from a tumor-associated antigen or from a pathogenic antigen. Antigen presenting cells, and DNA and cellular vaccines for treatment of cancer and infectious diseases, are also provided.